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ABSTRACT

This student manual on repairing the starter rewind spring on a small gas engine is the third of three in an instructional package on the starting system in the Small Engine Repair Series for handicapped students. The stated purpose for the booklet is to help students learn what tools and equipment to use in repairing the starter rewind spring and all the steps of the job. Informative material and photographs are provided on the tools and equipment and repairing the starter rewind spring. A rating scale and chart are included for evaluation of student progress. (YLB)

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STUDENT MANUAL

STARTING SYSTEM

REPAIR THE STARTER REWIND SPRING

2

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SMALL ENGINE REPAIR SERIES

2

STUDENT MANUAL 2

REPAIR THE STARTER REWIND SPRING

Prepared by
Pamela Hill

MATERIALS DEVELOPED AND DISTRIBUTED BY
OCCUPATIONAL CURRICULUM LABORATORY
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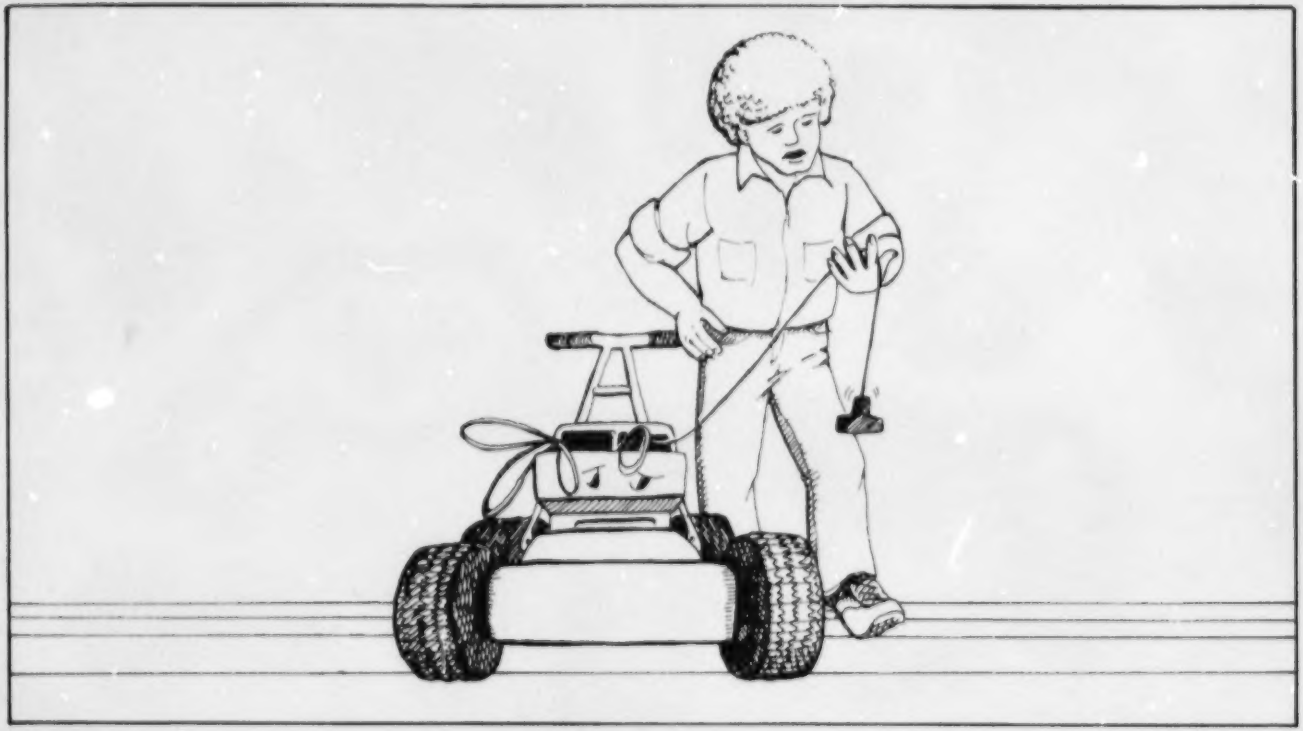
WHAT YOU WILL FIND IN THIS BOOKLET

The point of this booklet ..... Page 1

Tools and equipment—Repair the starter rewind spring ..... Page 2

Steps—Repair the starter rewind spring ..... Page 5

Can you repair the starter rewind spring? ..... Page 29



THE POINT OF THIS BOOKLET

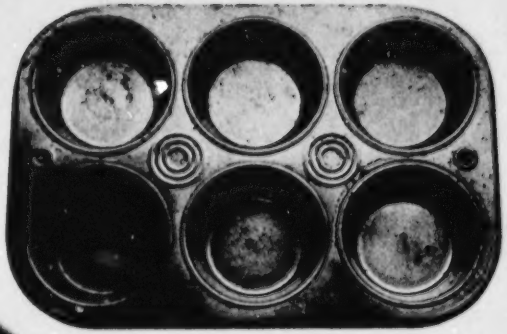
As a small engine mechanic, you may have to repair the starter rewind spring on a small gas engine. This booklet will help you learn what tools and equipment to use and all the steps of this job.

As you practice these steps on a real engine, you and your teacher can rate your progress on a chart on pages 29-32. Don't forget to follow the safety and good work habits that you have learned.

TOOLS AND EQUIPMENT:

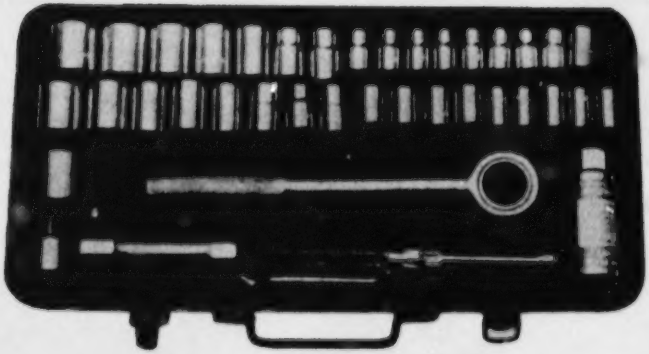
flat-tip screwdriver

safety glasses

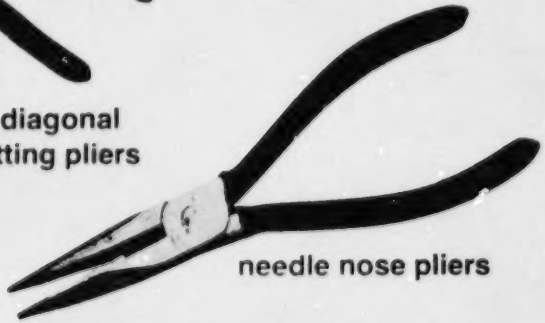


parts container

diagonal cutting pliers

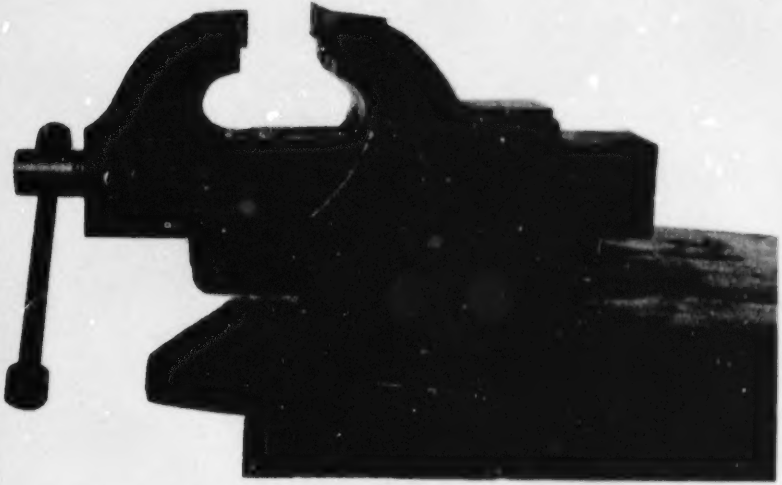


socket set



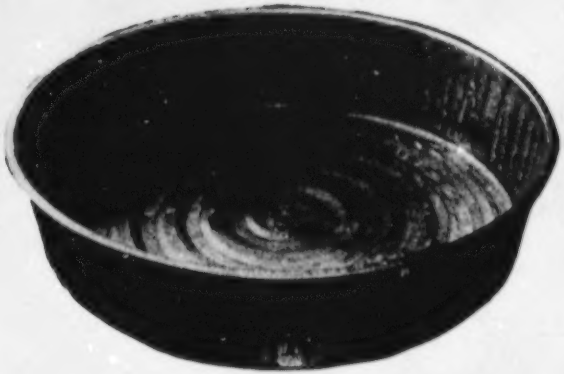
needle nose pliers

3/4" square wood stick
or 3/4" square metal bar with a T-handle



vise

Note: Your teacher may want you to use a special clutch holding tool instead of a vise and C-clamp.



container for cleaning fluid

cleaning fluid

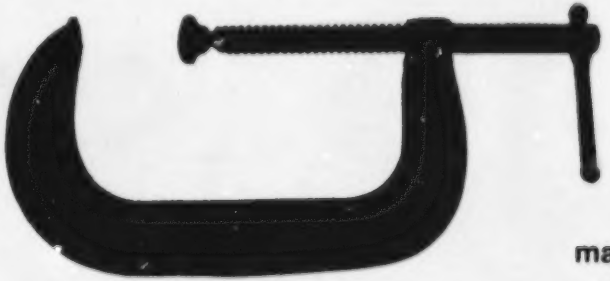
9

2 or 3 shop towels

new bumpers for tangs

new rewind spring

multi-purpose grease



6" or 8" C-clamp

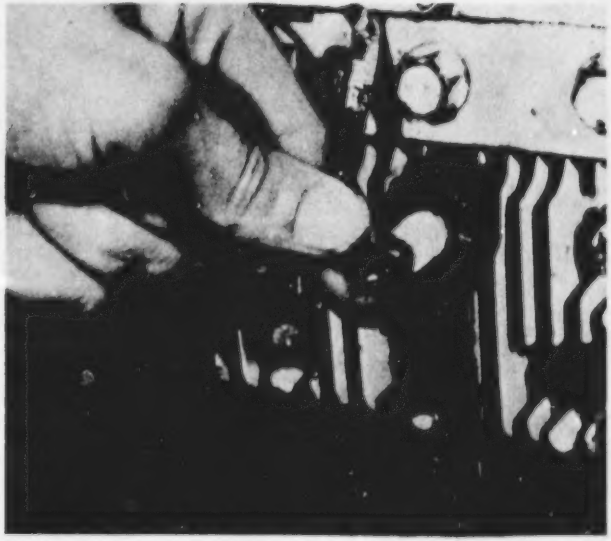
thin wire, paper clip or Briggs-Stratton rope inserter

matches

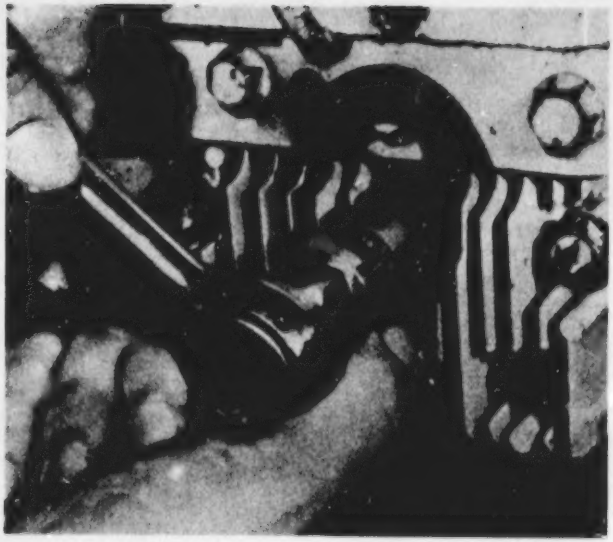
10

STEPS:

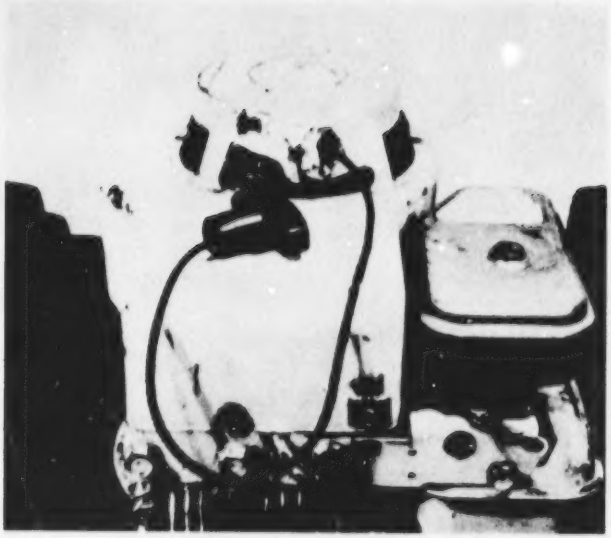
1. Put on your safety glasses.
   SAFETY TIP: Safety glasses will protect your eyes from the spring if it snaps or hits you in the face.



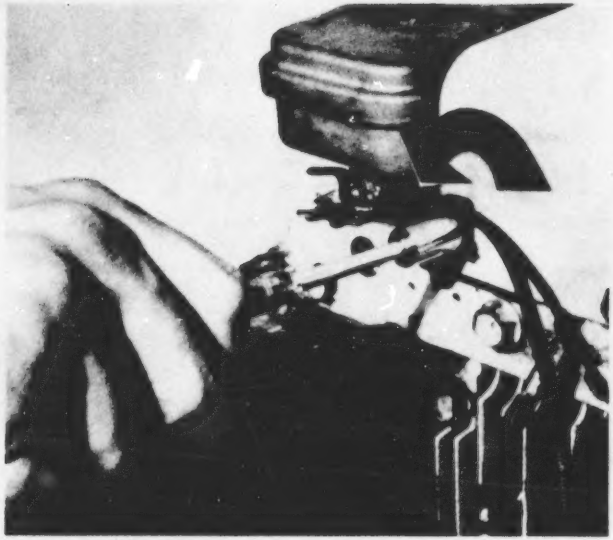
2. Pull off the spark plug wire.



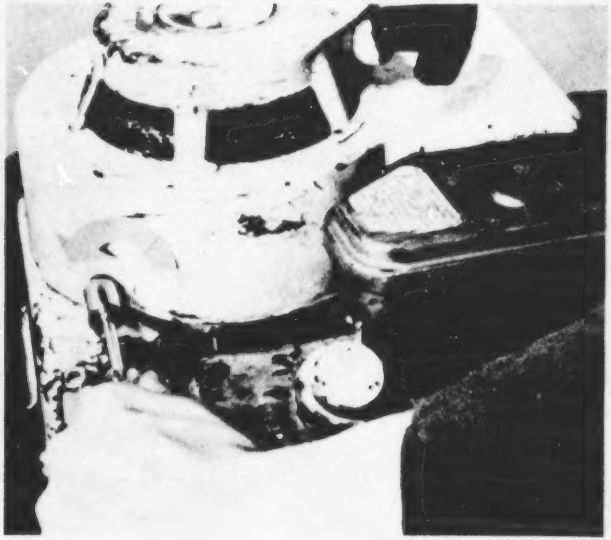
3. Remove the spark plug with a spark plug socket.
   CAUTION: Always use a spark plug socket to remove the plug so that it is not damaged.



4. Check the starter rope. If the rope is hard to pull out or does not rewind, then the spring has lost its tension or is broken. It will need to be repaired.

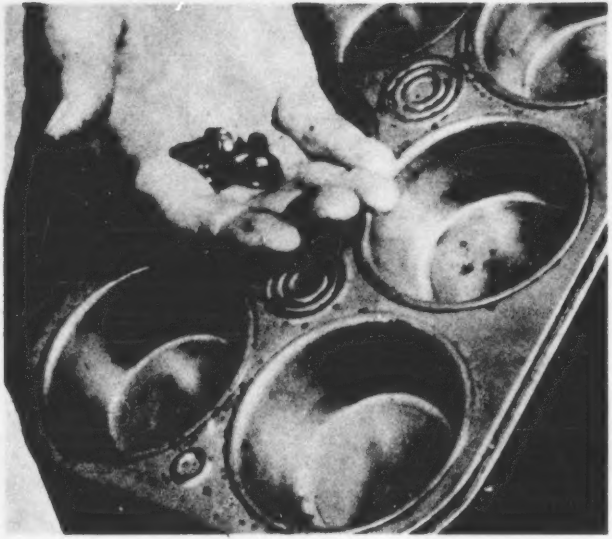


5. To repair the spring, first remove the throttle cable. Use a 5/16" socket and nut driver to loosen the cable clamp bolt.

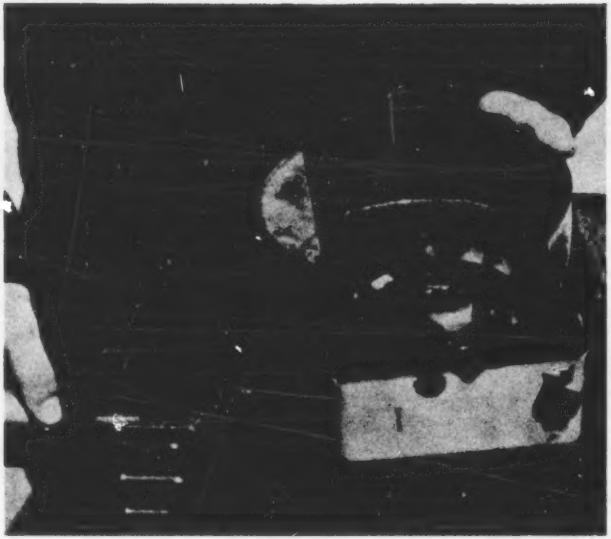


6. Remove the 3 bolts on the shroud with a 7/16" socket and nut driver.

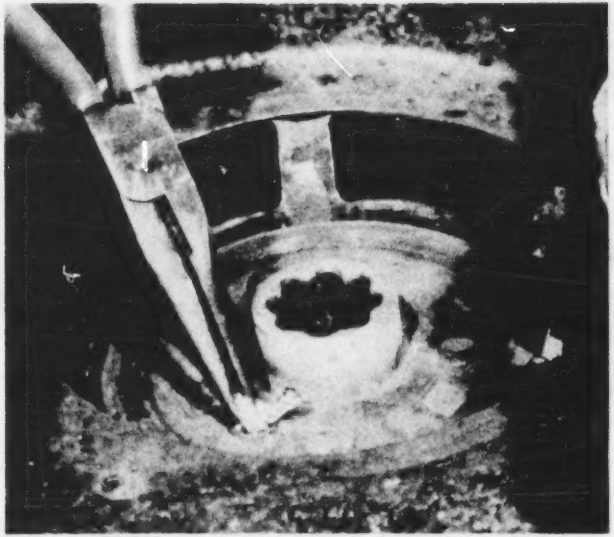
NOTE: On some engines, a ratchet handle or a 7/16" wrench will be needed to remove one of the bolts on the shroud.



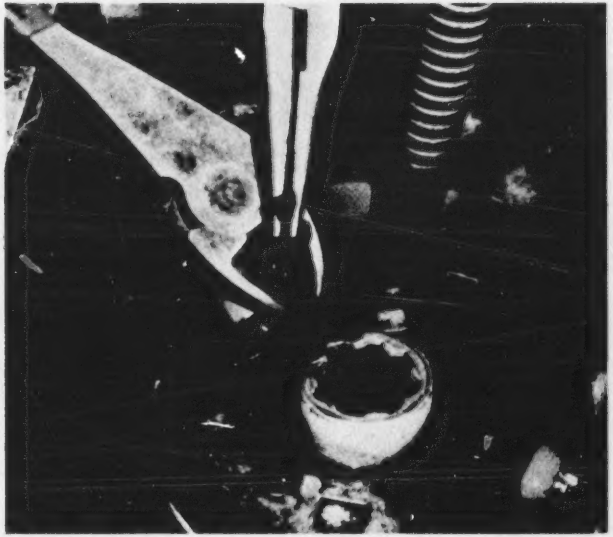
7. Place the bolts in a parts container so they will not get lost or mixed up with other bolts.



8. Lift off the shroud, turn it over, and place it in a vise.
   CAUTION: Do not overtighten the vise or the shroud will bend out of shape. 14

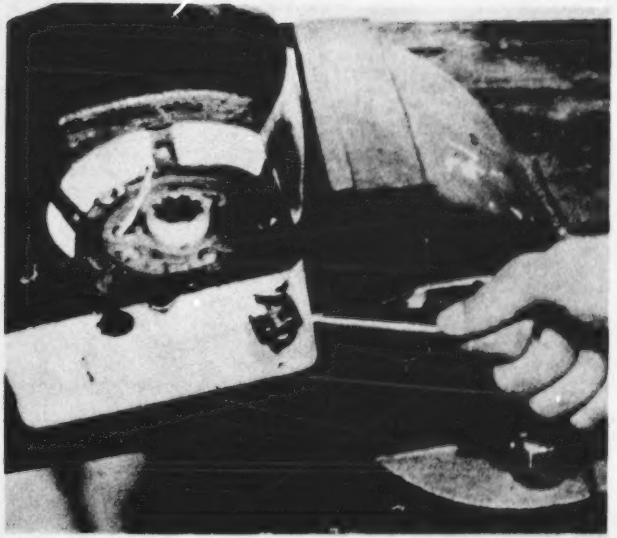


9. Using needle nose pliers, pull the knot on the rope away from the pulley hole.

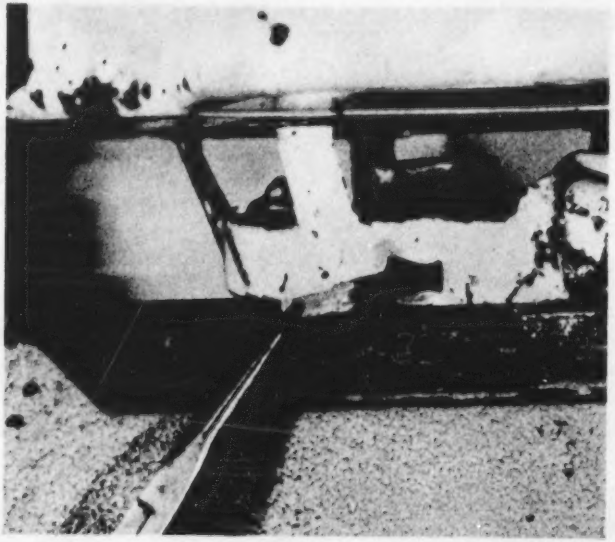


10. Cut off the knot with the diagonal cutting pliers.

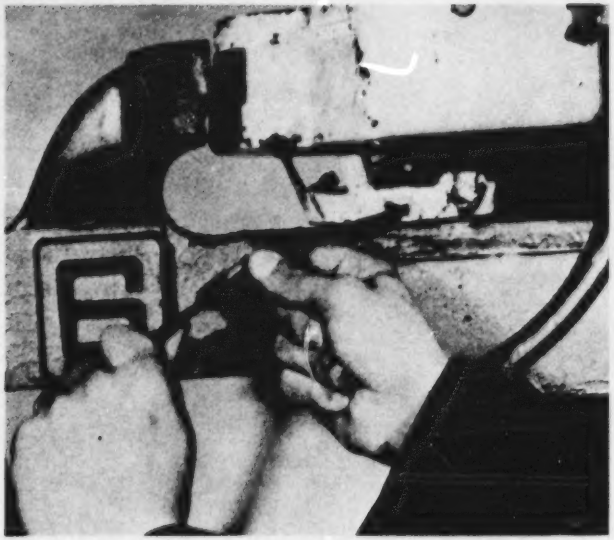
NOTE: If there is no knot showing on the pulley, then cut off the knot under the T-handle.



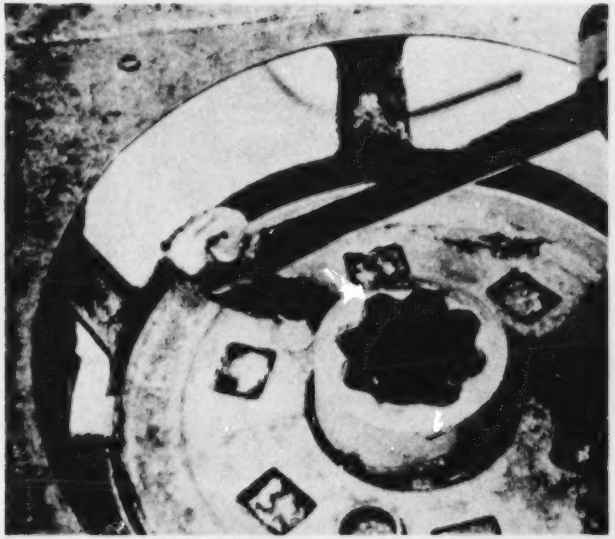
11. Slowly pull the rope out of the pulley.



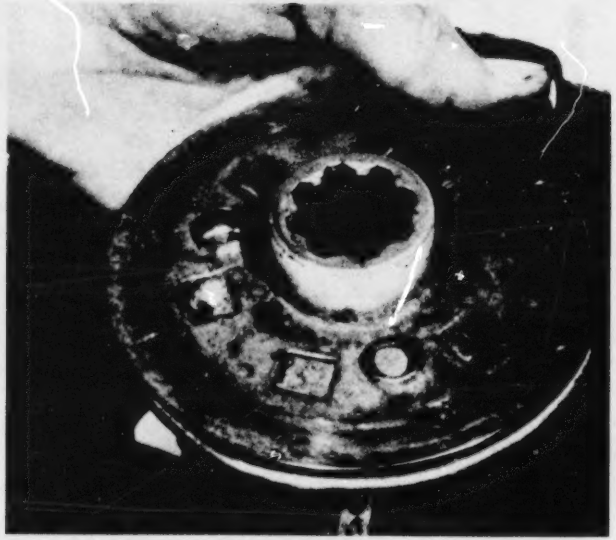
12. To remove the spring, use the needle nose pliers to unhook the spring hook from the starter housing.



13. **Using both hands, pull the spring out of the housing as far as possible.**
    SAFETY TIP: Hold tightly onto the spring so that it will not coil up and hit you.

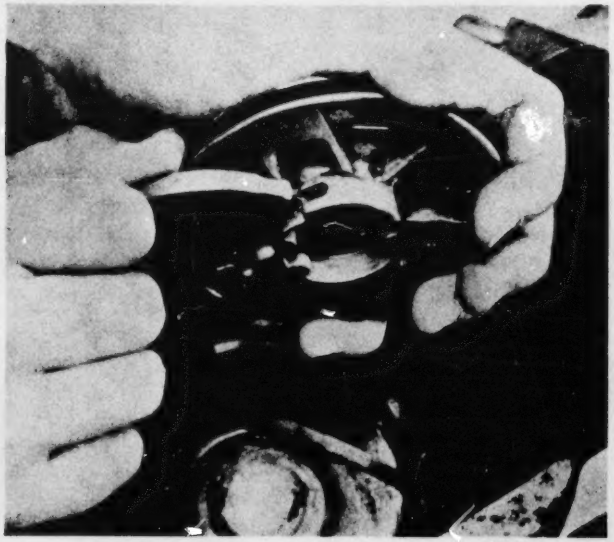


14. **While holding the spring out with one hand, bend up 1 bumper tang with a screwdriver.**
    NOTE: To remove the pulley, 2 or more bolts on *some* starter housings may need to be removed.



15. Carefully lift the pulley out of the housing.

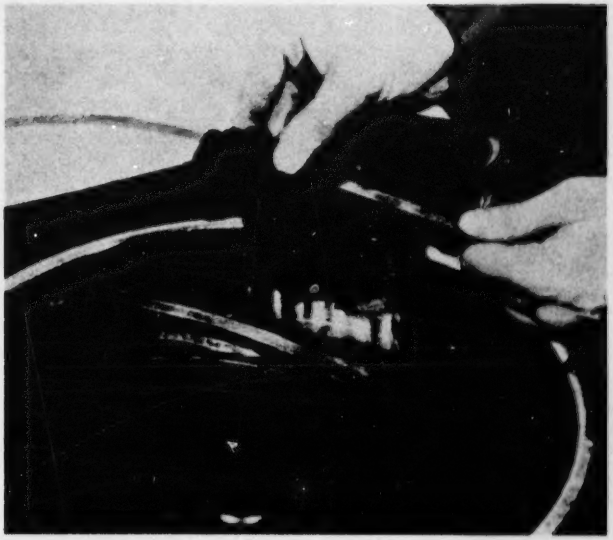
SAFETY TIP: Keep the spring unwound and out of the pulley so that it does not coil up and hit you.



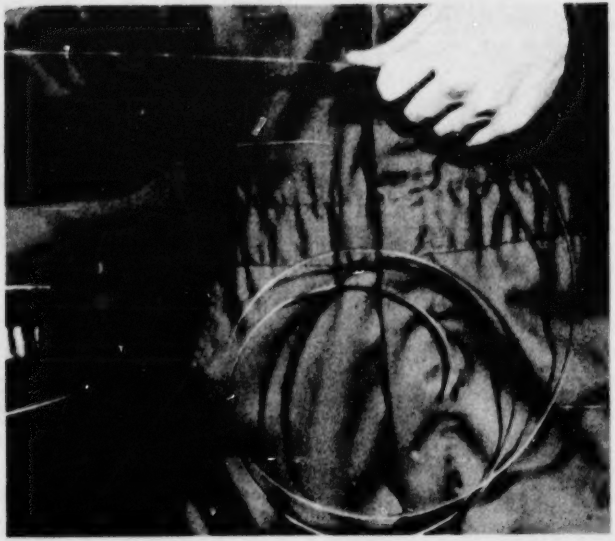
16. While holding out the spring, unhook it from the hub of the pulley. Set the pulley aside.

18

NOTE: If the spring is broken, you will want to replace it with a new spring.



17. With a shop towel, wash the spring in cleaning fluid to remove all dirt and grease.
SAFETY TIP: Open a window or turn on the air in the shop so that the fumes from the cleaning fluid won't become too strong.

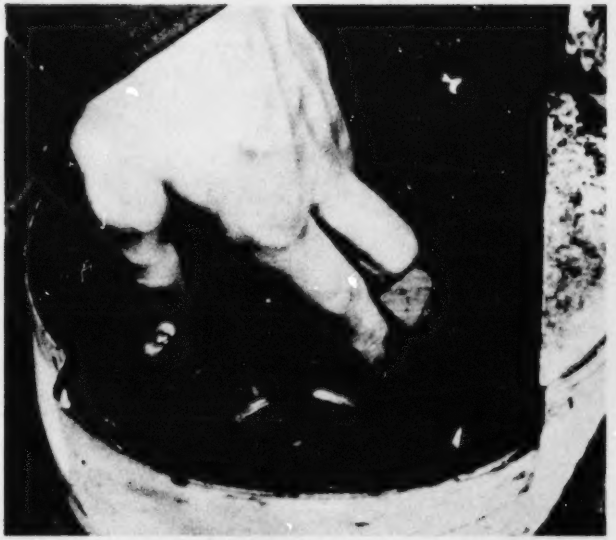


18. To straighten the spring, hold the coiled end of the spring in your left hand.

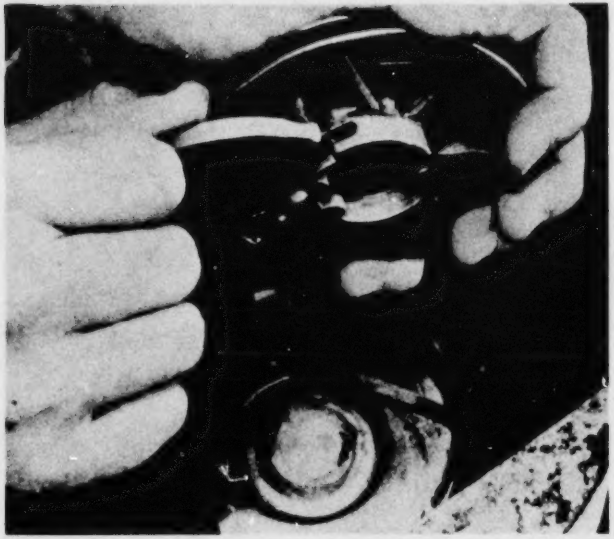
NOTE: Straightening the spring will give the spring more tension to rewind the rope onto the pulley.

19. In your right hand, grasp the spring between your thumb and fingers. Place your thumb on the outside curve of the spring. Pull the spring through with your right hand.

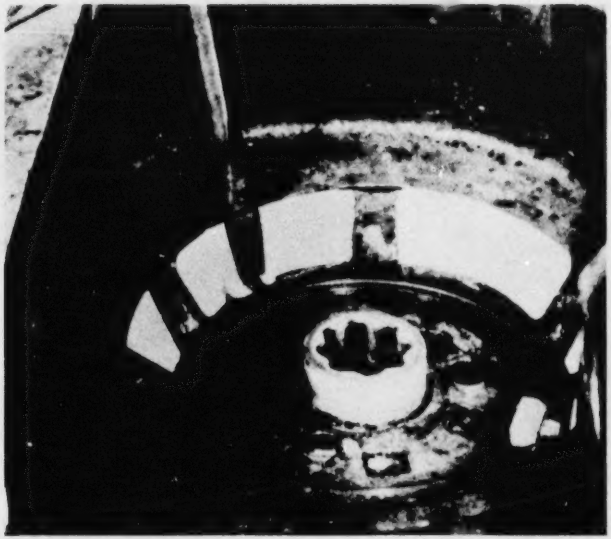
20. As you pull the spring through, straighten it against your thumb by slightly bending back the spring. When all of the spring is straightened, then set it aside.



21. With a clean shop towel, wipe the other parts of the starter housing. If the nylon bumpers on the tangs are worn, replace them with new ones.

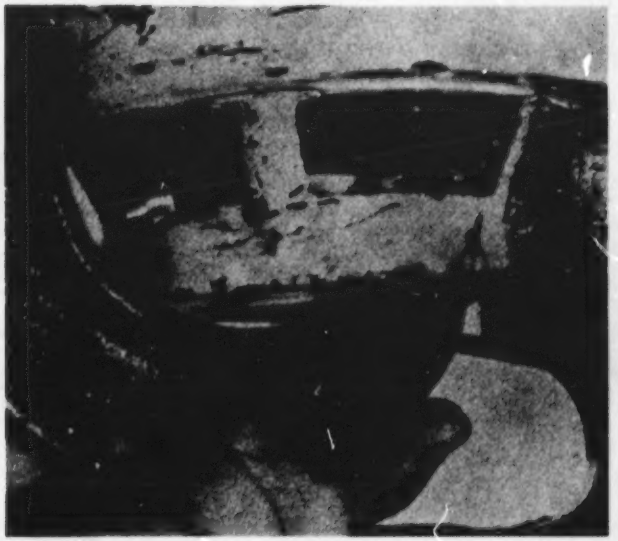


22. Hold the pulley near the starter housing. Put the spring hook through the hole on the housing and then into the hole on the pulley hub.

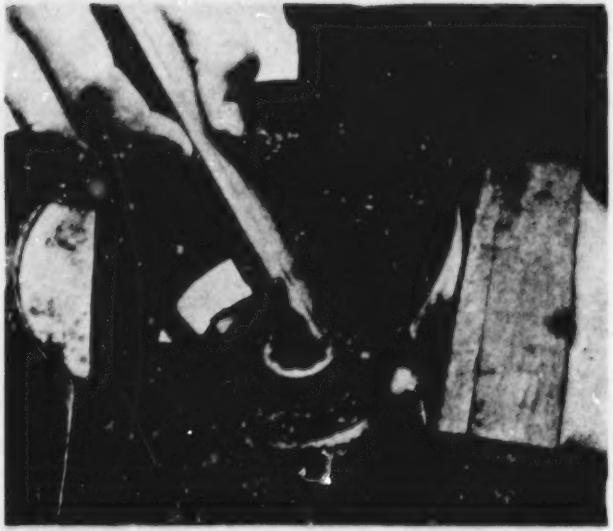


23. Set the pulley into the starter housing. Bend down the bumper tang. Let the spring hang loosely down the side of the shroud.

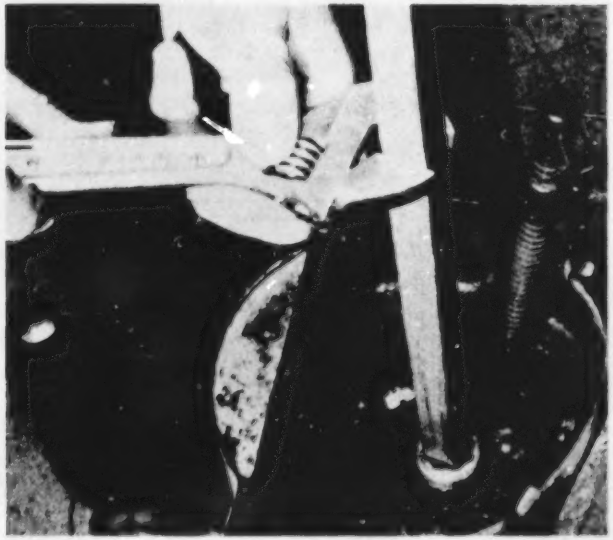
24. Place the C-clamp on one side of the pulley . . .



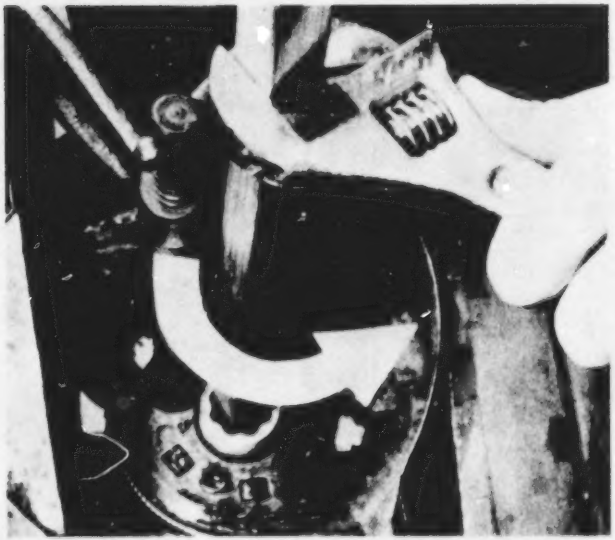
25. and on the bottom of the blower housing. Tighten the clamp just enough so that you will be able to rewind the spring into the pulley.



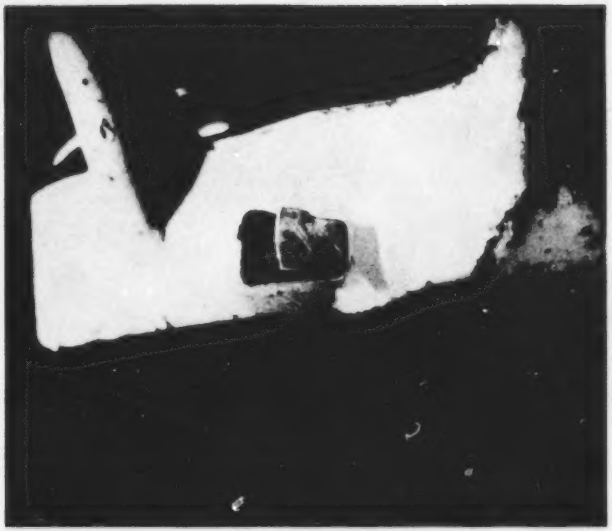
26. Place the 3/4" square stick into the center of the pulley hub. When the stick is turned, the pulley will wind up tne spring.



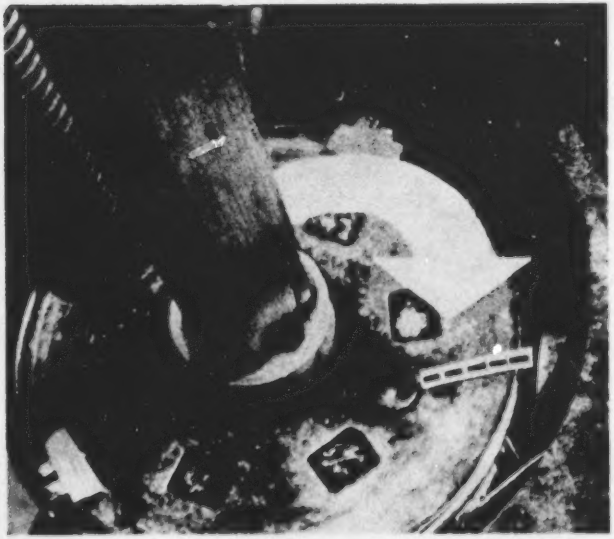
27. Fit the adjustable wrench securely onto the stick.
NOTE: If you are using a 3/4" metal bar with a T-handle on it, you will not need the wrench to wind up the spring.



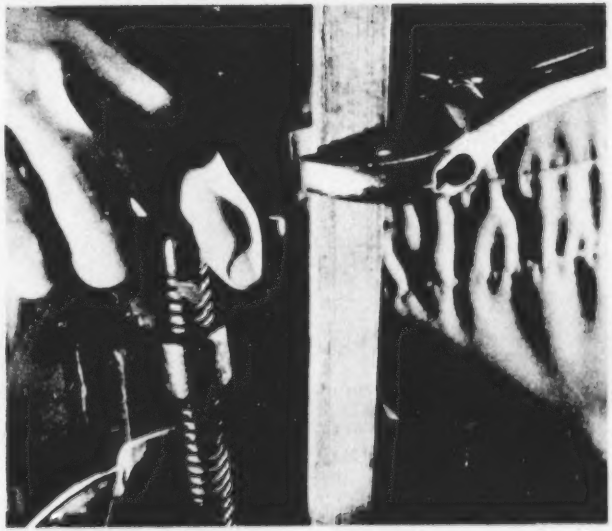
28. Turn the stick until the spring is wound up tight in the pulley.



29. Check the spring hook to see if it is secure in the hole on the starter housing. You may want to hold the hook in place with needle nose pliers.



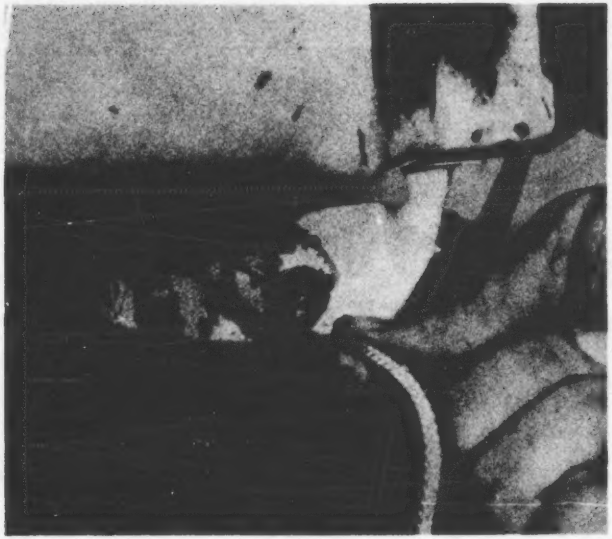
30. Turn the stick back until the hole in the pulley for the rope and the hole in the starter housing for the spring are lined up.



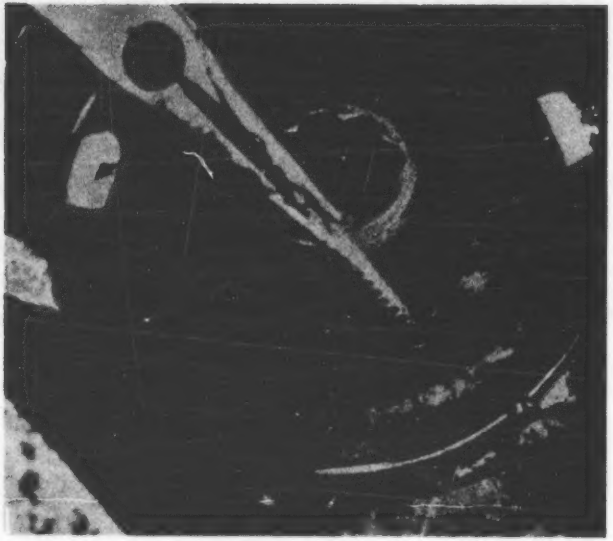
31. While holding the wrench, tighten the C-clamp.

NOTE: Do not let the wrench move or the spring will unwind.

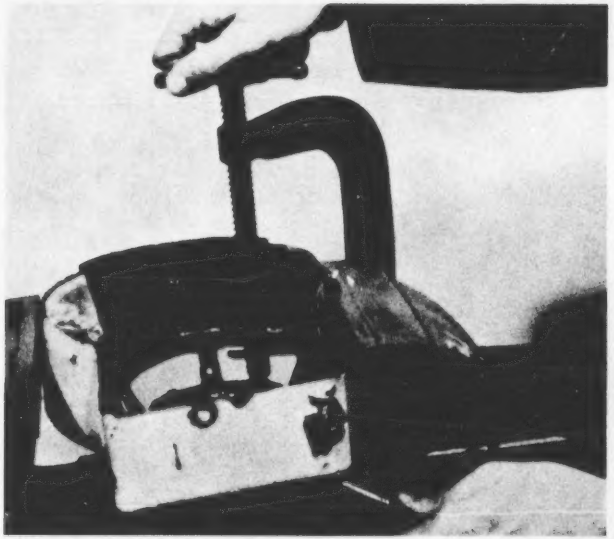
32. Remove the wrench and stick.



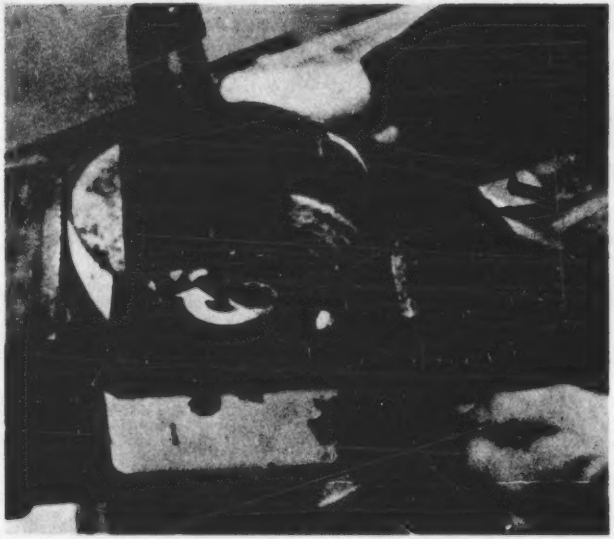
33. Using thin wire, push the starter rope through the holes on the housing and pulley. If the rope is frayed, replace it with a new nylon rope of the correct diameter and length.



34. Pull the wire and rope up through the holes, using the needle nose pliers, and then tie a knot at the end of the rope.

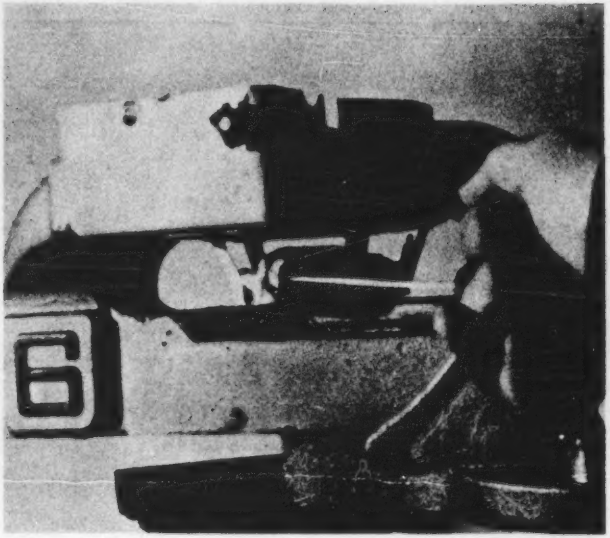


35. Hold tightly onto the rope and carefully remove the C-clamp.

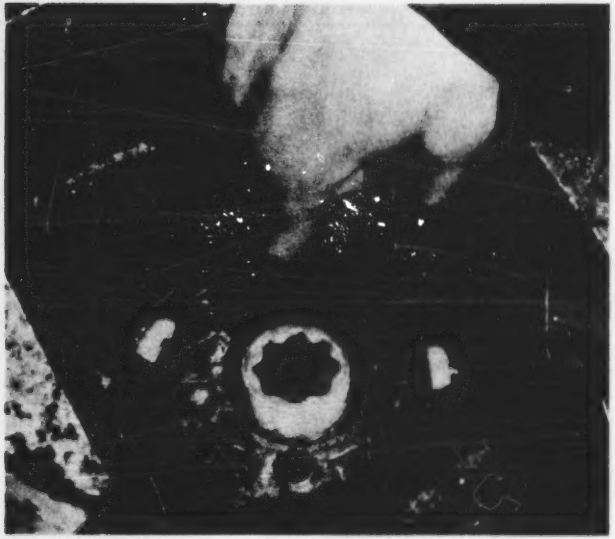


36. Let the rope slowly rewind into the pulley.

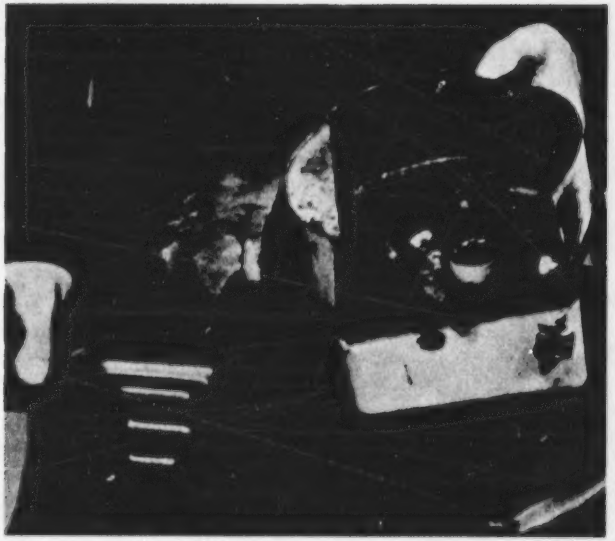
SAFETY TIP: Do not completely let go of the rope because the power of the spring could cause the rope to fly around and hit you.



37. Pull the rope out all the way to see if the rope and spring have been replaced correctly.

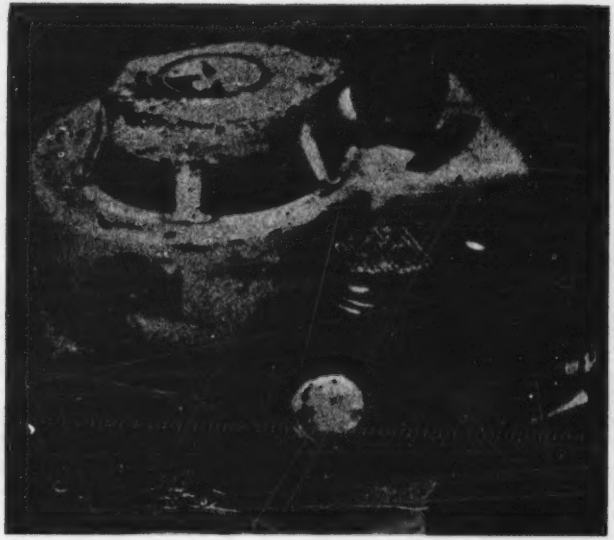


38. Place a small dab of grease on the top side of the pulley. This will lubricate the pulley when it rubs on the bumper tangs.

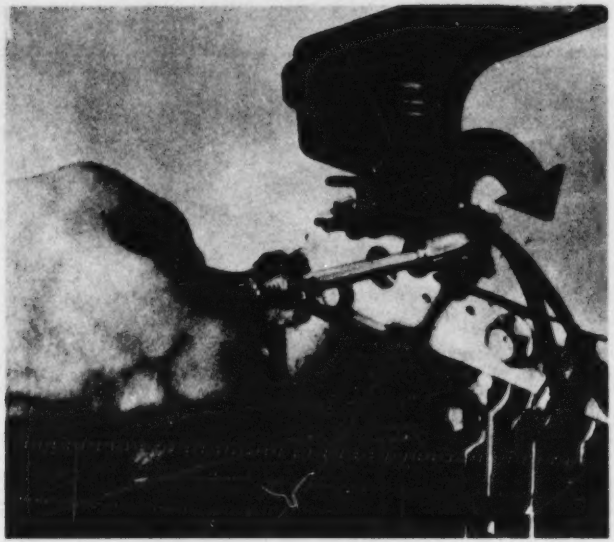


39. Remove the shroud from the vise and put the shroud back on the engine.

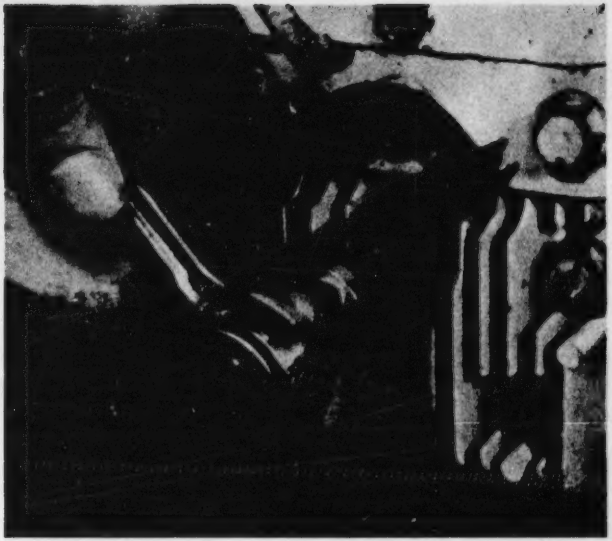
40. If the shroud does not fit tightly on the engine, then the clutch is not fitting into the pulley hub. Pull out the starter rope until the shroud slips into place.



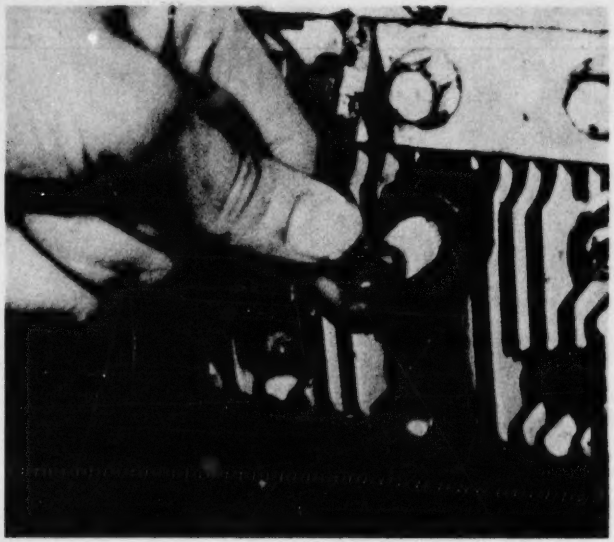
41. Using the 7/16" socket and nut driver, replace the bolts which hold the shroud on the engine.



42. Replace and adjust the throttle cable and tighten the cable clamp bolt.

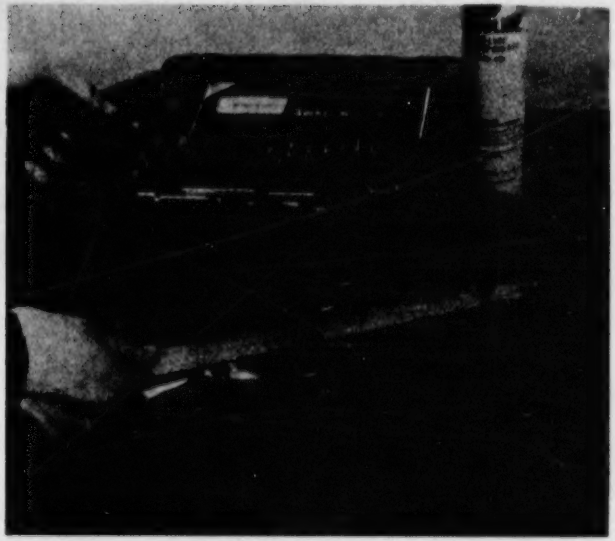


43. Replace the spark plug and tighten it with a spark plug socket.



44. Replace the spark plug wire.

45. Crank the engine several times to be sure that the starter and clutch work properly.



46. Clean up your work area. Clean tools and return them to the tool room. Place the broken spring in the trash, and put up dirty shop towels.

CAN YOU REPAIR THE STARTER REWIND SPRING?

Each day for 10 days practice doing this job and fill in the chart on the next pages. Use a rating number below that describes how well you do the steps of the job. By the end of 10 days you will see your progress.

Rating	Meaning
1 =	Can do simple parts of this job, but still needs to be shown how to do most of it.
2 =	Can do most parts, but may need help on hard parts.
3 =	Can do all parts without help. Ready for job entry with shop supervision.

REPAIR THE STARTER REWIND SPRING	DAYS									
	1	2	3	4	5	6	7	8	9	10
1. Assembles and uses tools correctly										
2. Wears safety glasses and removes spark plug wire and spark plug (Steps 1-3)										
3. Checks rewind spring for jamming (Step 4)										
4. Removes throttle cable and shroud and places shroud in vise (Steps 5-8)										
5. Removes the starter rope (Steps 9-11)										

REPAIR THE STARTER REWIND SPRING	DAYS									
	1	2	3	4	5	6	7	8	9	10
6. Removes the rewind spring (Steps 12-16)										
7. Determines if new spring is needed in pulley (Note, page 13)										
8. Cleans and straightens the old rewind spring and starter housing (Steps 17-21)										
9. Installs new or repaired rewind spring and pulley (Steps 22-30)										
10. Secures the pulley and rewind spring and replaces the starter rope (Steps 31-36)										

REPAIR THE STARTER REWIND SPRING	DAYS									
	1	2	3	4	5	6	7	8	9	10
11. Checks the rope and lubricates pulley (Steps 37-38)										
12. Reassembles shroud, bolts, the throttle cable, spark plug, and spark plug wire on engine (Steps 39-43)										
13. Cranks engine and checks to see that starter and clutch work (Step 44)										
14. Cleans up work area and returns tools to the tool room (Step 45)										